ANNUAL REPORT

UPON THE

HEALTHINESS OF THE CITIZENS,

AND UPON THE

SANITARY CONDITION

OF THE

CITY OF NORWICH.

FOR THE YEAR

1898.

BY

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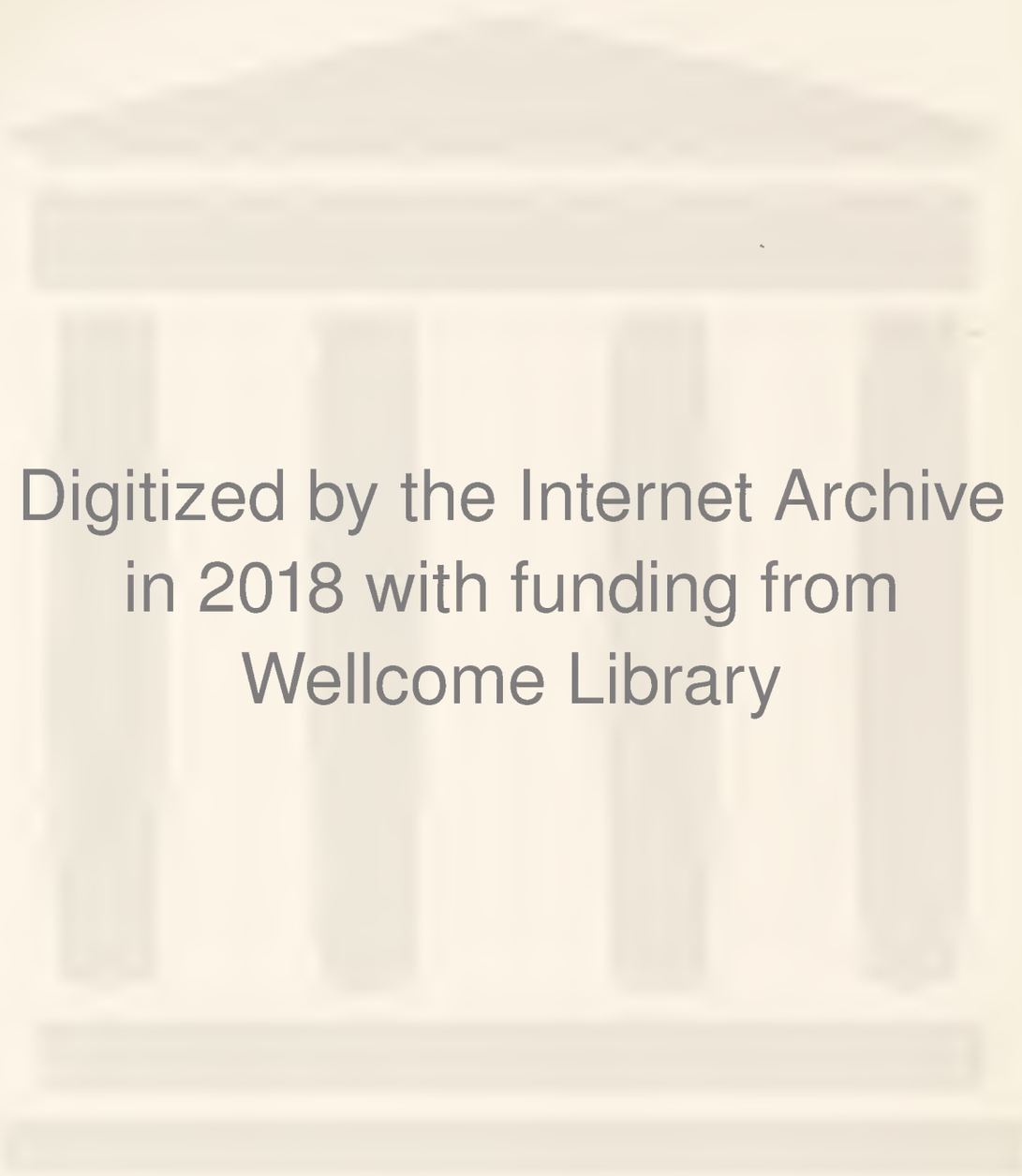

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PREFACE.

TO THE CHAIRMAN AND MEMBERS OF THE NORWICH URBAN SANITARY AUTHORITY.

GENTLEMEN,

By a General Order of the Local Government Board, dated 23rd March, 1891, it is prescribed that every Medical Officer of Health shall :—

"*Make an Annual Report to the Sanitary Authority up to the end of December in each year, comprising a summary of the action taken, or which he has advised the Sanitary Authority to take, during the year for preventing the spread of disease, and an account of the sanitary state of his district generally at the end of the year.*

"*The Report shall also contain an account of the enquiries which he has made as to the conditions injurious to health existing in the district, and of the proceedings in which he has taken part, or advised under any statute, so far as such proceedings relate to those conditions.*

"*Also an account of the supervision exercised by him, or on his advice, for sanitary purposes, over places and houses that the*

Sanitary Authority have power to regulate, with the nature and results of any proceedings which may have been so required and taken in respect of the same during the year.

"*The Report shall also record the action taken by him, or on his advice, during the year in regard to offensive trades, to dairies, cow sheds, and milk shops, and to factories and workshops.*

"*The Report shall also contain tabular statements of the sickness and mortality within the district, classified according to diseases, ages and localities.*"

This Report is made in fulfilment of the above regulations.

The population steadily increases, being estimated by the Registrar-General to be 111,699 in the middle of 1898, an increase of 1,545 over the estimated population of the preceding year. My own impression is that these figures slightly over-estimate the actual increase.

The birth-rate in 1898 was slightly below the average obtaining in the other great towns ; a feature in our returns attributible, in my judgment, to the larger number of relatively aged people we include in our population. Of the newly-born, we lost, during their first year of existence, 2 per 1,000 less than last year; but our loss still remains 16 per 1,000 higher than the average loss in the other great towns. The certified causes of deaths in the children under one year of age who died during 1898, are set out in detail in the body of this Report. The lives of 54 per cent. of these infants were insured.

I direct attention to the fact that while the general death-rate and the Zymotic death-rate are fractionally higher than the corresponding rates for the last year ; the death-rate in children under one year of age, the death-rate between the ages of one and five years, and the death-rate from Tuberculous Diseases, and the Infant Mortality rate are lower than they were last year. The gross general death-rate is below the (averaged) corresponding rate for the thirty-three great towns ; but the Zymotic death-rate is, on the other hand, higher. This unpleasing feature we chiefly owe to the prevalence with its accompaning mortality, of Measles, of which highly infectious and most dangerous disease (both in respect of its immediate and remote effects), we suffered a prolonged and severe invasion ; and besides Measles, Whooping Cough and Diarrhœa were both fatally active. Until the soil about our houses be covered with materials impervious to fluids, until the practice of preserving excrement in the neighbourhood of the dwellings be given up, and until, inside the home, greater care be bestowed upon the storage, preservation, and preparation of food, and in particular of milk, I do not think we shall be entitled to look for any notable reduction in the mortality from Diarrhœa among our children—given the climatal conditions which favour the ailment. Diarrhœa was, as usual, most fatal in the third quarter of the year.

Over 1,000 notifications of infectious diseases were sent in during the year, three-fourths of them being for Scarlet Fever, of which disease no less than 246 instances of *secondary* infection, or more than a third of the total number

of cases, were reported; adequate Hospital accommodation should have prevented the occurrence of nine-tenths of these. There was slight increase in the total amount of Enteric (Typhoid) Fever reported, accompanied by a smart rise in the mortality from it, which rose from 14·0 to 18·0 per cent. of the cases attacked. These deaths are chiefly attributible to the unfavourable conditions under which Enteric Fever has to be treated when it occur in, and is not removed to a Hospital from the homes of the poor. The provision of a Typhoid Ward in our to-be-enlarged Hospital, should lead to a saving of lives, as well as to a mitigation of distress, and to an actual diminution of the disease : twenty-four cases having been last year instances of *secondary* infection in dwellings previously reported. An increase in the number of notifications, and a fractional increase in its mortality-rate characterised our record for Puerperal Fever during the year. But of Diphtheria the record was better, 53 notifications only having been received, of these ten were *secondary* infections. This is a disease which is likely, I think, to give much trouble to sanitarians in the future, and seems to be less dependent upon sanitary conditions than are other infectious diseases ; it is known to be a *soil* poison, and although the precise conditions which favour its growth and propagation are not yet fully determined, its relative prevalence is known to be associated with climatal changes, and in particular with such alternations of wet and dry weather as lead to noticeable variations in the level of ground water. In the practical treatment of the disease, where for any reason a patient

cannot be removed (the proper course) to a Hospital, I am of opinion that in addition to injecting Anti-toxin into the patient, this prophylactic, as well as curative agent, should be injected into those who are likely to come into contact with the patient, if need be into all the dwellers in the affected habitation.

Chemical and bacteriological examination of the water supplied by the Water Company during the year shewed that it was of good quality, and free from harmful constituents. While firmly holding, as I do, that the water supplying and disease controlling Authority should be one and the same, I take pleasure in testifying to the care which is bestowed upon the filtration and storage of the water by the existing purveyors.

The investigations of the Courts and Yards Committee have already resulted in the settlement by magisterial decision of points which were at issue between property owners and the Committee ; and in the yet more important establishment of practically a minimum standard below which the Committee will not permit a yard to fall. I look forward to a substantial lessening in the amount of Typhoid Fever and of Diarrhœa when the paving, water supply, and sanitary accommodation in the Yards and Courts have been brought up to the standard required by the Committee.

The scavenging of the City has been during the past year, and is, now carried out with as great efficiency as is, under the system at present adopted, possible. For this efficiency credit must be given to the Chief Sanitary Inspector under

whose direction and supervision this department of our sanitary administration is placed ; but, as in previous years, I must direct attention to the great and, with a growing population, necessarily increasing cost of scavenging the City, and urge on the ground of economy, and yet more of healthfulness, the high desirability of adopting a general system of water carriage for the removal of excrement. In doing so I am not unmindful of the administrative and even legal difficulties which make the adoption of a water carriage system a policy, in the realisation of which it is wise to "hasten gently." Indeed, to secure an early attainment of the desired sanitary and social benefit, two things appear to be requisite (*a*) An amendment of the Public Health Act, simplifying the procedure of conversion, and possibly permitting the municipality to bear a portion of the cost, and (*b*) control of the water supply.

In the Public Analyst's Report, which is appended, will be found a record of the analyses of water, foods, &c., submitted to him during the year. The Chief Inspector's Report, which is also appended, gives in summarized from the Sanitary work carried out during the year, and more particularly states what changes have been effected to improve the sanitary condition of dairies, cow sheds, milk shops, slaughter-houses, common lodging-houses, factories, and workshops. With the increase in the staff of inspectors we may confidently look forward to further improvements.

I feel it a duty to place on record my indebtness to the Chief and Assistant Inspectors, the Office Clerks, and the

Matron and the Nurses at the Fever Hospital for their cheerful assistance and loyal obedience; qualities in them which have made my official relations a source of pleasure to me. I have, in particular, to mention my indebtness to my assistant and friend, Dr. R. J. Fox, D.P.H., who (owing to an affliction which temporarily disabled my eyesight), has prepared the whole of the statistical portion of this report, and has given me most valued assistance in treating the patients in the Fever Hospital, and with other parts of my work.

The Chairman, Vice-Chairman, and indeed all the members of the Health and its subordinate Committtes have, by many acts of kindness, added to my obligations.

(Signed),

H. C. PATTIN.

April 20th, 1899.

METEOROLOGICAL NOTES, 1898.

(From observations taken at Bradestone House, Brundall, Norfolk.)
*By Arthur W. Preston, Esq., F. R. Met. Soc.**

THE SEASONS.

The following tables show the average temperature and rainfall for the four Seasons together with those of the five previous years, and of a twenty-year approximate average. Winter comprises the three months December to February, inclusive; Spring, March to May; Summer, June to August; and Autumn, September to November.

TEMPERATURE.

SEASONS.	1893.	1894.	1895.	1896.	1897.	1898.	Twenty years' average.	Departure of 1898 from average.
	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.
Winter	36·5	39·2	34·7	39·6	38·3	41·3	37·8	+ 3·5
Spring	49·1	47·7	47·6	48·0	46·9	45·8	46·2	— 1·1
Summer	61·2	59·3	60·4	61·1	61·9	59·7	60·2	— 0·5
Autumn	50·0	50·1	51·4	48·5	50·3	54·0	49·5	+ 4.5
Year	49·6	49·2	48·4	49·3	49·5	50·5	48·4	+ 2·1

RAINFALL.

SEASONS.	1893.	1894.	1895.	1896.	1897.	1898.	Twenty years' average.	Departure of 1898 from average.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Winter	5·80	4.81	7·35	3·28	7·86	4·11	6·02	— 1·91
Spring	1·61	5·62	4·15	5·18	5·05	6·18	5·21	+ 0·97
Summer	5·37	8·74	7·51	4·88	4·17	6·90	7·17	— 0·27
Autumn	6·10	7·12	7·13	8·49	6·42	5·65	8·50	— 2·85
Year	19·66	27·32	24·91	23·28	22·07	23·33	26·90	— 3·57

The above tables show that the temperature of the Winter was considerably in excess of the average, that of the Spring and Summer slightly below, and that of the Autumn greatly in excess.

* To whom I am also indebted for the records of the mean weekly temperatures and of the rainfall quoted in Charts I and II.

1898.

Month.	Barometer.					Thermometer.					Hygrometer.	Cloud.	Rainfall.	
	Highest.	Date.	Lowest.	Date.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Relative Humidity 9 a.m.	Estimated Proportion.	Inches.	No. of Days.
	Inches.		Inches.		Inches.	Degrees.		Degrees.		Degrees.				
January	30·65	13	29·42	1	30·283	56·0	5, 6, 19	29·0	11	43·1	90	7·9	1·07	14
February	30·32	11	29·22	21	29·884	60·2	1	22·4	22	40·8	84	6·5	1·22	17
March	30·26	10, 11	29·40	26	29·873	63·4	18	22·8	6	39·7	85	6·6	2·18	16
April	30·25	8, 24	29·42	12	29·927	66·0	8	27·4	1	47·3	79	6·5	1·22	12
May	30·31	7	29·14	11	29·842	66·2	23	33·4	15	50·3	82	7·1	2·78	19
June	30·29	13, 17	29·50	25	29·985	74·4	18	36·8	1	56·9	82	7·5	3 22	16
July	30·36	10	29·62	23	30·085	76·0	18	40·0	21	59·5	78	6·4	2·00	8
August	30·27	25, 31	29 60	8	30·012	86·0	13	44·2	29	62·6	83	5·5	1·68	12
September ..	30·42	4	29·73	27	30·106	89·0	9	35·7	29	61·5	79	4·5	·17	4
October	30·40	4	28·94	18	29·854	68·0	2	37·0	2	54·2	90	6 8	2 48	15
November ..	30·40	18	28·90	25	29·859	60·8	2	29 2	23	46·3	94	6·6	3·00	19
December.. ..	30·50	22	29·10	29	30·026	56·0	4, 18	26·2	31	44·1	93	6·8	2 31	14
Means					29·978					50·5	85	6·5		
Extremes and Totals.	30·65	Jan. 13 & 15	28·90	Nov. 25		89·0	Sept. 9	22·4	Feb. 22				23·33	166

The Rainfall was deficient in each season, except the Spring, which gave nearly an inch of rain more than the average.

The dryness of the Autumn was abnormal, the deficiency of rain amounting to nearly three inches.

YEAR.

"The mean temperature of the year (50·5°) was more than 2 degrees above the average, and was higher than in any year since 1884. The warmest months were January, September, October, November, and December, in which the excess of temperature ranged from 4° to nearly 7° above the average. May, June, and July were somewhat colder than usual, but the departure from the average was so slight that it did but little to counterbalance the excess of warmth in the other months. The rainfall of the year, for the fourth year in succession, was considerably deficient, such deficiency having been in 1895, 1·99 ins., in 1896, 3·62 ins., in 1897, 4·83 ins., and in 1898, 3·67 ins., or a total deficiency of 14·11 ins. in the four years. In other words, we have had only $3\frac{1}{2}$ years' rain in the 4 years. September was the driest month, and June the wettest. There was a general tendency to dryness until May, which month, with June, was wetter than usual, and gave rise to predictions in many quarters, that, owing to the so-called "nineteen years weather cycle," the ensuing summer was to be exceptionally wet. The fallacy of this prediction was exemplified by the result, which showed a deficiency of rain during July, August, September, and October, amounting in the aggregate to as much as 4·70 ins. The number of days in the year on which rain was measured, was only 166, being the fewest in any year since 1884."

GEOLOGY OF NORWICH.

The geological construction of the soil underlying the City is simple in character. The higher levels are made up of glacial beds, through which the valleys have been excavated, exposing at their margins the crag formation and chalk, while gravel and alluvial deposits occupy the lower ground. The chalk, which at Norwich is more than 1,000 feet thick, and underlies the whole of the City, comes to the surface in the Market Place, and in other places at a similar level; but it may be reached at no great depth in all parts of the Municipal area. The order of the succession of the glacial and crag beds, is shewn in excavations on the sides of the high ground surmounted by Mousehold Heath, between which Heath and the City proper, winds the valley of the Wensum. Except for some layers of peat in the valley, and a bed of brick-earth over part of the higher ground (near the Victoria Station), the soil of the City is of a porous character, and much percolation of fluid takes place through the gravels, etc., into the chalk. The general trend of the drainage of the greater portion of the inhabited area of the City is toward the Wensum.

DEMOGRAPHICAL STATISTICS.

Enumerated Population at the Census of 1891 ...		100,970
Estimated Population in the middle of 1898 ...		111,699
Area in Statute Acres		7,558
Density of population (*i.e.*, number of persons per acre)		14·8
Average number of persons per acre in the 33 great towns		35·3
Total number of Births registered in 1898		3,329
Representing a Birth-rate of	29·9	per 1,000
Average Birth-rate of the 33 great towns being	30·4	„
Total number of Deaths registered in 1898		2,112
Representing a gross recorded Death-rate of	18·9	per 1,000
Deducting Deaths in Norwich of 44 non-residents	18·4	„
* "Corrected Death-rate" for the year ...	17·6	„
†Average Death-Rate in the 33 great towns	19·0	„
Average Norwich Death-rate for the last 5 years, 1894 to 1898 (inclusive)	18·5	„
Deaths from the seven principal Zymotic Diseases numbered		363
Representing a Zymotic Death-rate of ...	3·2	per 1,000
Average Zymotic Death-rate in 33 great towns being	2·8	„
Death-rate from *all* the Zymotic Diseases, including Influenza, was	3·5	„
Or, excluding Influenza	3·2	„

* The "Corrected Death-rate" signifies the Death-rate which would obtain in Norwich if the local age and sex distribution were the same as those of the country generally.

† Estimated from the Registrar-General's Quarterly Reports.

The Deaths of Norwich Citizens from Zymotic Diseases, included :—

	Scarlet Fever.	Diphtheria	Enteric Fever.	Measles.	Whooping Cough.	Diarrhœa.	Puerperal Fever.	Erysipelas.	Influenza.
Under 5 years of age	18	7	3	71	36	191	—	—	4
Over 5 years of age	6	7	45	5	—	12	8	4	28

A glance at the above table will show how very large a proportion of the deaths occurred in children under five years of age, and also how great a number of these succumbed to Measles, Whooping Cough, and Diarrhœa.

The Death-rate from the notified Infectious Diseases was... ... ... 0·8 per 1,000

The Death-rate from the un-notified Infectious Diseases, including the Tuberculous Diseases and Influenza, was ... ... 5·0 „

The Deaths under one year of Age numbered 639, representing a death-rate of 5·7 per 1,000 of the population at all ages.

The Infant Mortality Rate (*i.e.*, the proportion of deaths under one year of age to every 1,000 births) was ... ... 194·25

In the 33 great towns it averaged ... ... 178·0

This is, for us, a slightly more satisfactory result than that of last year. A special report gives detailed information.

The Death-rate between the ages of 1 *and 5 years* was 2·3 per 1,000 of the population at all ages.

The Death-rate between the ages of 1 *to* 60 was* 7·4 per 1,000 living.

The average rate in the 33 great towns being 9·5 per 1,000 living.

* Estimated from the Registrar-General's Quarterly Reports.

The Death-rate at and above 60 years of age was* 63·6 per 1,000 living.

The average rate in the 33 great towns being 71·2 per 1,000 living.

These remained gratifying features; and again proved the accuracy of the estimate I made in 1893, viz., that we had in Norwich a higher proportion of elderly people than was to be found in the other great towns—a testimony in itself to the life-prolonging influence of the Norwich climate *for those who survive their first quinquennium*.

The Registrar-General not having, as yet issued his Annual Report, I am unable to give special rates for the 33 great towns.

Special Norwich Death-rates for 1898.

	Per 1,000 of the population at all ages.	In 1897.
From all Tuberculous Diseases ...	1·8	2·1
„ Tuberculosis of the Lungs (Phthisis)	1·0	1·4
„ Respiratory Diseases excluding Phthisis	2·5	2·7
„ Heart Diseases	1·8	1·7
„ Scarlet Fever	0·2	0·1
„ Diphtheria	0·12	0·09
„ Enteric (Typhoid) Fever ...	0·4	0·3
„ Puerperal Fever	0·06	0·02
„ Erysipelas	0·03	0·01
„ Measles	0·68	0·02
„ Whooping Cough	0·27	0·4
„ Diarrhœa...	1·8	1·2
„ Rheumatic Fever	0·007	0·7
„ Influenza...	0·24	0·13

The Deaths from Lung Diseases, excluding Phthisis (Tuberculosis of Lungs commonly called "Consumption") occurred:

In East Wymer	131	From Heart Diseases	74
„ West Wymer	153	„ „	126

* Estimated from the Registrar-General's Quarterly Reports.

The Registered Births numbered in East Wymer, 1,704; West Wymer, 1625.

In East Wymer the births in the second quarter exceeded in number those recorded in any other. In West Wymer in the first quarter. In East Wymer there were more females than males born in the first and last quarters, and in West Wymer in the second quarter. In each district the males were in excess during the other quarters.

The following Deaths occurred in Public Institutions :

	At all ages.	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.
Norfolk and Norwich Hospital ...	112	9	7	12	11	58	15
The Union Infirmary	99	10	2	1	4	26	56
The Isolation Hospital	8	0	7	1	0	0	0
Jenny Lind Infirmary	1	0	0	1	0	0	0
*The Prison	3	0	0	0	0	3	0
The Barracks ...	9	3	2	0	2	2	0

I have prepared differentiated death-rates (see overleaf) for the separate Parishes in the City; these "special area" death-rates should, apart from their statistical interest, lead the Sanitary Authority to devote increased attention to the most insanitary of the districts under its jurisdiction.

Comparing East Wymer with West Wymer we get the following results.

The birth-rate in East Wymer was 32·2 per 1,000 of the population at all ages.

* This institution retains its pre-eminence as the healthiest dwelling we provide for our people.

The birth-rate in West Wymer was 27·5 per 1,000 of the population at all ages.

The death rate (from all causes) in East Wymer *was 17·6 per 1,000 of the population at all ages.

The death-rate (from all causes) in West Wymer *was 20 0 per 1,000 of the population at all ages.

The gross Zymotic death-rate in East Wymer was 4·3 per 1,000 of the population at all ages.

The gross Zymotic death-rate in West Wymer was 2 1 per 1,000 of the population at all ages.

The death-rate from Tuberculous Diseases in East Wymer was 1·6 per 1,000 of the population at all ages.

The death-rate from Tuberculous Diseases in West Wymer was 2·2 per 1,000 of the population at all ages.

The infant mortality-rate in East Wymer was 200 per 1,000 births.

The infant mortality-rate in West Wymer was 186 per 1,000 births.

Or, stating the same facts in words ; East Wymer had a higher birth-rate, a higher death-rate from Zymotic Diseases, a higher infant mortality-rate, a lower general death-rate, and a lower death-rate from Tuberculous Diseases that West Wymer.

Inquest cases amounted to 5·8 per cent. of deaths from all causes.

In the 33 great towns the average was 7·4 per cent.

Deaths in Public Institutions amounted to 11·8 per cent.

In the 33 great towns the average was 20·9 per cent.

Uncertified deaths (*i.e.*, death certificate not signed by a registered Medical Practitioner) amounted to 0·8 per cent.

Average in 33 great towns, 1·2 per cent.

* Excluding deaths of non-residents.

The 2,112 deaths from all causes registered in 1898 were distributed as follows :

	At all ages.	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.
*East Wymer ...	932	319	148	26	35	185	219
†West Wymer ...	1180	320	112	39	55	305	349
Deaths occurring within the district among persons not belonging thereto	44	3	1	2	5	26	7

At the Census in 1891, *East Wymer contained 47,936 people; †West Wymer, 53,034. Assuming the rate of increase to have progressed in the same proportion in these districts, the population of each in the middle of 1898 would be (approximately) : *East Wymer, 52,807 ; †West Wymer, 58,893.

Deaths from Zymotic Diseases.

	Scarlet Fever.	Diphtheria.	Enteric (Typhoid) Fever.	Puerperal Fever.
In East Wymer	4	3	25	7
„ West Wymer	20	11	23	1

	Erysipelas.	Measles.	Whooping Cough.	Influenza.	Diarrhœa.
In East Wymer	3	50	20	10	98
„ West Wymer	1	26	16	22	105

The Deaths from Tuberculous Diseases were distributed :

In East Wymer from Phthisis 42 Other Tuberculous Diseases 49
„ West Wymer „ 77 „ „ 48

* Conisford and Coslany are now included in the East Wymer Registration District
† The Norfolk and Norwich, Jenny Lind, and Isolation Hospitals, and the Union Infirmary are all in the West Wymer Registration District.

Death Rates per 1,000 of the Population (at all Ages).

Estimated Population 1898.	PARISH.	At all Ages.	Under 1 year.	1 and under 5.	65 and upwards.	Zymotic Diseases.	Tubercu-lous Diseases.	Respiratory Diseases.	Heart Diseases.
770	All Saints	18·0	3·8	—	6·5	3·8	—	—	3·8
776	S. Andrew	6·4	1·5	—	6·0	—	—	1·5	1·5
2641	S. Augustine	19·0	6·4	3·8	2·7	5·7	1·52	3·3	1·1
2164	S. Benedict	21·2	9·2	1·8	2·3	3·6	2·7	4.5	2·7
7498	S. Clement (without) S. Clement (within)	14·8	5·3	1·8	2·9	3·3	1·2	2·3	1·2
647	S. Edmund	14·8	5·9	—	3·0	—	2·0	2·0	1·5
813	S. Ethelred	20·8	6·1	2·4	6·1	2·4	1·2	6·1	2·4
1622	S. Geo. Colegate	19·0	9·2	3·1	3·6	4·9	1·8	3·1	1·2
718	S. Geo. Tombland..	8·3	1·4	1·4	1·4	—	1·4	—	2·4
1471	S. Giles	19·0	7·4	2·7	4·7	3·3	2·7	2·7	2·0
616	S. Gregory	12·9	8·1	1·6	3·2	3·2	—	3·2	—
638	S. Helen (with the Great Hospital) ..	¶28·2	3·1	—	20·3	1·6	—	3·1	1·6
400	S. J. Maddermarket	7·5	—	—	7·5	—	—	2·5	—
2986	S. J. Sepulchre	17·7	5·7	4·0	5·0	7·7	1·6	2·7	0·3
1151	S. J. Timberhill	16·5	6·9	4·3	3·5	1·7	1·7	0·9	2·6
1624	S. James..	36·9	12·3	5·49	6·7	6·7	4·9	5·5	3·7
1902	S. Julian..	11·1	2·6	1·7	3·0	2·5	0·5	2·0	1·0
529	S. Lawrence	19·0	3·8	—	7·6	—	3.8	1·9	—
622	S. Margaret (with Jenny Lind Infirmary)	*11·2	1·6	—	3·2	1·6	3·2	—	1·6
755	S. Martin-at-Palace	15·6	3·9	2·6	6·5	6·5	1·3	2·6	3·9
2649	S. Martin-at-Oak	22·6	9·2	4·1	4·1	7·0	3·0	2·6	1·5
1235	S. Mary-at-Coslany	25·4	13·1	4·1	2·5	13·1	3·2	3·2	—
789	S. Michael-at-Coslany	15·6	6·0	1·2	1·2	3·6	2·4	—	1·2
172	S. Michael-at-Plea	11·6	—	—	5·8	—	5·8	—	—
1741	S. Michael-at-Thorn	20·6	7·9	4·5	1·7	3·9	3·4	3·9	1·1
4970	S. Paul	16·6	6·6	2·8	3·2	2·6	2·6	2·6	1·0
331	S. Peter-at-Hungate	9·0	—	3·0	6.0	—	3·0	—	3·0
2079	S. Peter Mancroft	13·0	3·5	0·5	4·0	1·5	1·0	1·0	2·5
3022	S. Peter-per-Mountergate	13·3	2·7	2·3	4·6	1.6	1·0	2·3	1·6
758	S. Peter Southgate	13·2	2·6	2·6	3·9	1·3	1·3	2·6	2·6
1499	S. Saviour	19·3	7·3	2·0	5·3	2·0	1·3	3·3	3·3
316	S. Simon & S. Jude	18·9	6·3	3.2	3·2	3·2	6·3	—	3·2
3912	†S. Stephen (with N. & N. Hospital) ..	41·5	6·0	3·7	8·5	5·0	3·7	3·7	3·0
755	S. Swithin	23·7	6·6	1·3	2·6	2·6	3·9	6·5	1·3
2019	Eaton	20·0	4·5	2·0	6·0	5·5	2·0	3·5	1·5
266	Earlham	15·0	--	—	11·2	3·8	—	—	3·8
32925	‡Heigham (with Union)	20·9	6·1	2·0	6·7	4·1	2·4	2·7	2·4
788	Hellesdon (part of)	15·2	1·3	3·9	5·2	1·3	2·6	3·9	—
3667	§Pockthorpe (with Cavalry Barracks)..	12·4	6·2	2·1	1·3	3·5	1·0	0·8	0·5
5751	‖Thorpe Hamlet (with Britannia Barracks and Prison)	14·2	4·5	2·3	3·9	3·4	1·0	1·0	1·1
316	Trowse, Carrow and Bracondale ..	15·8	—	—	9·5	3·1	—	3·1	3·1
535	Cathedral Precincts (S. Mary-in-Marsh)	7·4	1·9	—	5·6	—	—	1·9	—
19	On Boats and Barges (Wensum) ..	—	—	—	—	—	—	—	—
9445	Lakenham	16·7	4·9	2·4	4·3	4·1	1·4	2·7	1.3

	All.	One.	1 to 5.	65.	Zm.	Tub.	Resp.	Heart.
* Deducting deaths in Jenny Lind Infirmary True rate for S. Margaret's	24·1	6·4	4·8	6·4	1·6	1·6	6·0	1·6
† Deducting deaths in Norfolk and Norwich Hospital True rate for S. Stephen's ...	15·0	4·6	0.75	3·3	1·25	1·1	3·0	0·5
‡ Includes S. Bartholemew, S. Philip, Trinity, and S. Thomas, Heigham (deducting deaths in Workhouse and Isolation Hospital) true rate	14·5	5·2	1·2	3·8	2·5	1·6	2·5	1·7
§ Pockthorpe true rate (deducting Cavalry) ...	17·5	10·0	2·0	0.6	4·8	1·9	2·7	3·4
‖ Thorpe Hamlet true rate (deducting Infantry)...	16·0	5·5	1·2	3·0	1·9	1·7	2·5	1·8

¶ Deducting Deaths in Great Hospital, 6·0 per 1,000 at all ages.

Deaths in Separate Parishes.

Enumerated Population at 1891 Census	PARISH.	At all ages.	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.	Zymotic Diseases.	Tuberculous Diseases.	Respiratory Diseases.	Heart Diseases.	Inquests.
706	All Saints	14	3	2	—	1	3	5	2	—	—	2	—
720	S. Andrew	5	1	—	—	—	—	4	—	—	1	1	1
2419	S. Augustine	50	17	10	2	4	10	7	15	4	9	3	1
1982	S. Benedict	47	20	4	3	1	14	5	8	6	9	6	2
6876	S. Clement (without) } S. Clement (within) } ..	111	40	14	2	7	26	22	25	9	16	8	4
593	S. Edmund	10	4	—	—	—	4	2	—	2	2	1	2
745	S. Ethelred	17	5	2	—	—	5	5	2	1	5	2	1
1486	S. Geo. Colegate.. ..	31	15	5	—	—	5	6	7	3	5	2	—
658	S. Geo. Tombland ..	6	1	1	1	—	2	1	—	1	—	2	1
1346	St. Giles'	28	11	4	—	—	6	7	5	4	4	3	1
565	S. Gregory	8	5	1	—	—	—	2	2	—	2	—	2
585	S. Helen (with the Great Hospital)	18	2	—	—	—	3	13	1	—	2	1	—
367	S. J. Maddermarket ..	3	—	—	—	—	—	3	—	—	1	—	—
2734	S. J. Sepulchre	53	17	12	1	1	7	15	23	5	8	1	1
1054	S. J. Timberhill	19	8	5	—	—	2	4	2	2	1	3	2
1497	S. James	60	20	9	2	3	15	11	11	8	9	6	3
1742	S. Julian	22	5	3	1	4	3	6	5	1	4	2	2
485	S. Lawrence	10	2	—	—	—	4	4	—	2	1	—	1
570	S. Margaret (with Jenny Lind Infirmary) ..	7	1	—	—	—	4	2	1	2	—	1	1
692	S. Martin-at-Palace ..	12	3	2	—	—	2	5	5	1	2	3	1
2426	St. Martin-at-Oak ..	61	25	11	1	2	10	11	19	8	7	4	4
1131	S. Mary-at-Coslany ..	31	16	5	—	1	6	3	14	4	4	—	2
723	S. Michael-at-Coslany ..	13	5	1	2	1	3	1	3	2	—	1	2
158	S. Michael-at-Plea ..	2	—	—	—	—	1	1	—	1	—	—	—
1595	S. Michael-at-Thorn ..	36	14	8	1	3	7	3	7	6	7	2	—
4552	St. Paul	83	33	14	—	3	17	16	13	13	13	5	2
303	S.Peter-at-Hungate ..	3	—	1	—	—	—	2	—	1	—	1	—
1904	S. Peter Mancroft ..	26	7	1	—	1	9	8	3	2	2	5	—
2767	St. Peter-per-Mountergate	40	8	7	1	1	9	14	5	3	7	5	1
695	S. Peter Southgate ..	10	2	2	—	—	3	3	1	1	2	2	—
1364	S. Saviour	29	11	3	—	—	7	8	3	2	5	5	1
290	S. Simon & S. Jude ..	6	2	1	—	—	2	1	1	2	—	1	1
3584	S. Stephen (with N. & N. Hospital	166	24	15	10	19	64	34	20	15	15	12	30
692	S. Swithin	18	5	1	—	—	10	2	2	3	5	1	2
1848	Eaton	40	9	4	4	1	10	12	11	4	7	3	—
244	Earlham	4	—	—	—	—	1	3	1	—	—	1	2
30084	Heigham* (with Union) ..	636	187	61	14	29	139	206	126	75	82	74	26
722	Hellesdon (part of) ..	12	1	3	1	—	3	4	1	2	3	—	1
3365	Pockthorpe (with Cavalry Barracks) . ..	46	23	8	3	—	7	5	13	4	3	2	2
5265	Thorpe Hamlet (with Brit. Barracks and Prison) .	81	27	14	2	3	15	23	20	6	6	7	10
290	Trowse,Carrow,and Bracondale	5	—	—	1	—	1	3	1	—	1	1	—
490	Cathedral Precints (S.Mary-in-Marsh) .. .	4	1	—	—	—	—	3	—	—	1	—	—
17	On Boats and Barges (Wensum)	—	—	—	—	—	—	—	—	—	—	—	—
8553	Lakenham	167	49	21	6	5	40	43	41	11	27	13	5

*Includes St. Bartholomew, St. Philip, Trinity, St. Thomas.

The populations of the various parishes are calculated from the actual populations recorded at the 1891 census. It has been assumed that the rate of increase in the population of each parish has continued at the rate which prevailed in the preceding decade. It is more than probable, however, that when the census is taken again (and this counting of people ought to be held at least once in every five years), the populations of the central parishes will be found to have increased less in proportion (if they have not actually declined) than those of the parishes more remote from the centre of the City. The rates for 1898 therefore are but approximate ones, albeit, the best we can arrive at under existing circumstances and give, if my forecast be a right interpretation of the facts, *the central parishes more favourable rates* than they actually merit.

Comparing these "Parish" death-rates with one another and with the corresponding mortality rates for the City, as a whole, we see that St. James' *again easily heads the list* with a *gross death-rate from all causes* of 36·9 per thousand of its population at all ages. St. Mary-at-Coslany comes second with a death-rate of 25·4 per 1000, and St. Swithin follows with one of 23·7 per 1000. At the other end of the scale are St. Andrew with a gross death-rate of 6·4 per 1000, St. Mary-in-the-Marsh with one of 7·4 per 1000, and St. John de Maddermarket 7·5 per 1000! The corresponding death-rate *for the whole City* being 18·9 per 1000.

Comparing the "Special" death-rates in the like manner we find the death-rate in children *under one year of age* reached 13·1 per 1000 of the population at all ages in St. Mary-at-Coslany, 12·3 per 1000 in St. James', and 9·2 per 1000 in St. George Colegate, St. Benedict, and St. Martin-at-Oak; while St. John de Maddermarket, St. Peter-at-Hungate, St. Michael-at-Plea, Earlham and Trowse, Carrow and Bracondale all come out with ciphers. The death-rate in children under one year of age for the *City as a whole* was 5·7 per 1000 of the population *at all ages.*

Between the *ages of one and five years* 5·5 per 1000 of the total population at all ages died in St. James', 4·5 per 1000 in St. Michael-at-Thorn, and 4·3 in St. John's-at-Timberhill; while in All Saints', St. Edmund, St. Helen, St. Lawrence, St. Margaret, St. Michael-at-Plea, Trowse, Carrow and Bracondale, and St. Mary-in-the-Marsh no deaths occurred. The average rate for the *City, as a whole,* being 2·3 per 1000 of its total population.

At and above 65 years of age 20·3 per 1000 of its total population died in St. Helen's (including inmates of the Great Hospital), 11·2 per 1000 in Earlham, 9·5 in Trowse, Carrow, and Bracondale; while in St. Michael-at-Coslany, Pockthorpe, and St. George Tombland these deaths averaged 1·2, 1·3, and 1·4 per 1000. The death-rate at these ages for the *City, as a whole,* was 4·9 per 1000.

From *Zymotic Diseases* there died in St. James' no less than 7·7 per 1000 of its population at all ages, in St. John de Sepulchre 7·0 per 1000, in St. Martin-at-Oak and St. Edmund, 6·7 per 1000; whereas in St. Andrew's, St. George Tombland, St. John de Maddermarket, St. Lawrence, St. Peter-at-Hungate, and St. Mary-in-the-Marsh no deaths occurred. The death-rate from Zymotic diseases for the *City, as a whole,* was 3·2 per 1000.

Tuberculous Diseases (forms of the disease commonly called "Consumption") swept off 6·3 per 1000 of its total population in St. Simon and St. Jude, 5·8 per 1000 in St. Michael-at-Plea, and 4·9 per 1000 in St. John Timberhill; whereas All Saints', St. Andrew, St. Helen, St. John de Maddermarket, St. Gregory, Earlham, Trowse, Carrow, and Bracondale, and St. Mary-in-the-Marsh lost no one from these diseases. The death-rate from Tuberculous diseases averaged for the *City, as a whole,* 1·8 per 1000 of the total population.

From *Respiratory Diseases* (excluding Phthisis) 6·5 per 1000 of its total population died in St. Swithin, 6·1 per 1000 died in St. Etheldred, and 5·5 per 1000 in St. James'; while in All Saints,

St. George Tombland, Earlham, St. Margaret, St. Michael-at-Plea, St. Michael-at-Coslany, St. Peter-at-Hungate, St. Mary-in-the-Marsh, and St. Simon and St. Jude there were no deaths recorded. The death-rate for the *City, as a whole,* being 2·5 per 1000 of the total population.

Heart Diseases carried off 3·9 per 1000 of the population in St. Martin-at-Palace, 3·8 per 1000 in Earlham, and 3 8 per 1000 in All Saints'. *Per contra* heart diseases killed off no one in St. Gregory, St. John de Maddermarket, St. Lawrence, St. Mary-at-Coslany, St. Michael-at-Plea, and St. Mary-in-the-Marsh. The death-rate for the *City, as a whole,* was 1·8 per 1000 of the population.

Last year then St. James' had the *highest general death-rate* (double that for the City as a whole!) the *highest death-rate* between 1 and 5, and the *heaviest "Zymotic" death-rate;* St. Mary-at-Coslany the *heaviest infant mortality;* St. Martin-at-Palace lost most people (proportionately) from *Heart diseases;* St. Simon and St. Jude's suffered worst from the *Tuberculous diseases;* St. Swithin lost most people (proportionately) from the *Respiratory diseases;* St. Andrew with an estimated population of 776 had the lowest general death-rate.

I have, in the foregoing paragraphs, selected only a few "Parish" death-rates; the individual reader being left to institute much more elaborate comparisons. If the said reader wish to guage the relative healthiness of any special parish, the important death-rates to be considered, are (*a*) *the death-rate under one year of age,* (*b*) *the death-rate at and over 65 years of age,* (*c*) *the zymotic death-rate* and (*d*) *that from tuberculous diseases.* He will do well to bear in mind the facts that a very low death-rate at and over 65 years of age does not necessarily point to a high standard of healthiness; on the contrary it may mean that practically everybody is killed off in that particular parish before the age of 65 is reached!

Infant Mortality.

The certified causes of death in children dying under one year of age were :—

Abscess	1	Hydrocephalus ...	2
Acute Ædema... ...	1	Heart Diseases ...	4
Aphthæ	2	Immaturity	4
Asthenia	14	Imperfect development ...	1
Atalectasis	4	Intussusception ...	2
Atrophy	3	Intustinal obstruction ...	1
Bronchitis	45	Inanition	1
Broncho-Pneumonia ...	28	Influenza	3
Burns	2	Malnutrition	4
Cardiac Malformation ...	1	Marasmus	60
Cerebral Congestion ...	1	Measles	15
Chicken Pox	1	Meningitis	2
Convulsions	50	Muco-Enteritis ...	3
Congenital Syphilis ...	7	Obstructed Birth ...	2
Cleft Palate	1	Parocid abscess ...	1
Croup	1	Peritonitis	1
Cyanosis	1	Premature Birth ...	75
Debility from Birth ..	39	Purpura	1
Deformity	1	Rickets	4
Diarrhœa	142	Scarlet Fever	2
Dentition	20	Stomatitis	4
Diphtheria	2	Strangulation... ...	1
Dropsy	1	Spina Bifida	2
Enteritis	5	Suffocation	1
Entero Colitis... ...	6	Syncope	2
Fissure of Skull ...	1	Tuberculous Diseases ...	21
Gastritis	2	Whooping Cough ...	12
Gastro Enteritis ...	18	Want of Vitality ...	1
Gastro Intestinal Catarrh	7		

Seventeen of the deaths were uncertified, *i.e.*, the certificate of death was not signed by a medical practitioner.

"Premature Birth" was given as the cause of death in the majority (10) of these cases. I have again to point out how discreditable it is to the State to lose a single subject without being furnished with a properly attested medical certificate of the cause of death. The law now allows a Registrar, almost always a layman, to accept a certificate from an unqualified person, provided that he, the Registrar, is persuaded that no deception is being practised. The proper course is, without doubt, to hold an inquiry in every such case, and, where needful, a post-mortem examination. These steps, will probably only be taken when the Registration of the causes of Death is made a department of the Medical Officer of Health's Office. It is gratifying to note that whereas in 1897 the uncertified cases amounted to 4·4 per cent. of the total number, in 1898 the proportion was 2·6 per cent.

It does not require any technical knowledge on the part of the reader to see that some of the certified causes of death, quoted on the preceding page, remain as vague as in previous years. "Marasmus," for instance, which is not, properly speaking, a disease (it is a symptom of disease and is a term used to signify wasting) is made accountable for no less than 60 of the deaths! It would be more satisfactory if to "Marasmus" the certifier added "cause unknown," when he is uncertain about it. "Want of Vitality," again is a singularly uninforming phrase. Until the information afforded becomes more precise, these returns will remain of but small value.

It still remains a truism that so long as the State demands from the doctors, for the public use and good, certificates of the causes of death, and awards no payment for them, it cannot expect the said doctors, men, after all, merely human, to give careful attention to the thankless task. Some few doctors, of their own accord, take great pains to furnish clear, reliable, and therefore to the demo-

graphical statistician, most valuable information respecting the true antecedents to death; it is the business of the State, by awarding a fee for the service rendered, to entitle the M. O. H. to claim in all cases the fullest possible information.

An important point to be noticed is that while the average infant mortality rate for the 33 great towns (as compared with 1897) increased 2·0 per 1000 births, that of Norwich decreased 2·0 per 1000 births; a gratifying result, and one, we must hope that we shall find yet further emphasised in the future. No deaths are certified as being due to "improper dieting"; though there is little doubt that a large number of those classified under the ambiguous term "Marasmus" are due to this cause; a cause, which originates in, and flourishes by reason of, the ignorance of the hygiene of infant life so lamentably prevalent among otherwise affectionate mothers. Unrecognised Tuberculous Disease, in my private judgment, accounts for others of these deaths so desipiently ascribed to "Marasmus," as it probably does for some of the deaths attributed to "Convulsions," under which heading it will be seen no less than 50 deaths were registered; Bronchitis swept off 45, Diarrhœa 142, and Whooping Cough 12. "Premature Birth" and "Debility from Birth" between them account for no less than 94 The other features do not call for special comment, save that there is a fall of 35 % in the number of deaths attributed to Hereditary Syphilis, and that Atrophy (3) and asthenia (14) probably signify at bottom improper feeding.

I again caused enquiries to be made concerning *the number of children dying under one year of age who were insured*, and found that 51 % of the total number were insured; an increase of 4 %.

FEVER HOSPITAL.

During the year 364 patients with Scarlet Fever were removed to and treated in the Fever Hospital; and had our accommodation been better adapted to meet the requirements of the City, I have no hesitation in saying that a very much larger number would have been treated. Indeed, during the whole of the year we had people waiting for the beds to be emptied; there being, sometimes, as many as a *dozen applicants for the first vacancy.* However, gratifying from our point of view, this anxiety to share in the benefits conferred by the Hospital may be, from another aspect it becomes very disheartening to those responsible for the administration of the Institution and in particular to its Medical Superintendent; we have still to campaign against infective ailments with such inadequate forces. We ought to have beds provided in a proportion approximating to 1 per 1000 of the population—as a matter of fact we have not at present half that number—the mere statement of which fact enables the reflective to at once realise our situation. That we made the fullest use of our restricted resources is very certain; and that the Hospital is so highly appreciated by the people remains a source of great satisfaction, and makes all associated with it desirous of seeing its possible usefulness afforded every opportunity of development. *The lack of hospital accommodation* was responsible for more than one-third of the cases of Scarlet Fever which *occurred during the year;* our being unable to remove the first case from a dwelling constantly led to the occurrence of secondary and tertiary cases in the family or immediate neighbourhood. Had we been able to bring even a score of additional beds into use, I feel confident that a very large number of the secondary cases which were notified would not have occurred.

Of the 364 cases removed to the Hospital 169 were males and 195 females.

76	of the	patients	were	under 5	years of age.
170	„	„	were	between 5 and 10	years of age.
79	„	„	„	10 and 15	„
25	„	„	„	15 and 25	„
14	„	„	„	over 25	„

It will be noticed that the greater number of the patients (170) were between 5 and 10 years old—the school-going period. On the other hand that so many as 25 between 15 and 25, and 14 were over 25 years of age, indicates of itself that the infecting material was widely disseminated.

There were eight deaths in the Hospital, seven from Scarlet Fever ; representing a death-rate of 2 0 per cent., considering the crowded state of the Wards a very satisfactory result ; one death that of a girl is not included as she died from Tuberculous disease. The certificates of death of these eight cases were :—

(*a*) Tuberculous Meningitis—Spinal Caries
(*b*) Scarlet Fever ; Acute Nephritis
(*c*) Diphtheria (Post Scarlatinal) Syncope
(*d*) Malignant Scarlet Fever—Cellulitis Septicœmia
(*e*) „ „ „ Septicœmia
(*f*) „ „ „ „
(*g*) „ „ „ „
(*h*) „ „ „ „

Sixteen deaths occurred from Scarlet Fever in patients treated in their own homes representing 3·5 per cent.

Eight patients developed post-scarlatinal Diphtheria and with one exception were successfully treated with Schering's Anti-toxin. We had an inconsiderable amount of Scarlatinal Rheumatism, rather less glandular trouble than usual, and a troublesome amount of the relatively intractible inflammatory affection of the nostrils, which is frequently associated with Scarlet Fever. There were fewer cases of suppurating ears and in only one single instance did mastoid trouble necessitate operative proceedings. On the whole, complications of all kinds were relatively rare, and there were only four really serious kidney cases. Two of the patients certified to have Scarlet Fever brought in Rötheln as well, and there were four cases with mixed Scarlet and Morbilliform Rashes. These are the sort of cases that, were suitable accommodation at our disposal, I should like to place in " Observation Wards." These patients made satisfactory recoveries.

There were nine " return " cases during the year—a result which bears testimony to the vigilence exercised in discharging patients—particularly when the fact that we have *no properly constructed discharging rooms fitted up*, and have to make use of one of the ordinary wards in the central pavilion for the purpose, is remembered.

The Hospital Sub-Committee continues the policy adopted in 1893, and find its sufficient justification in the rapid and continuous growth in popular favour of the Institution. In 1893 barely 25 per cent. of the fever cases were sent to the Hospital, in 1894 this proportion increased to 60 per cent., in 1895 the numbers rose to 75 per cent., and in the first half of 1896 to 80 per cent. of the total number of cases. During the past two years the percentage rate has been determined by the number—even when the wards were overcrowded—we could accommodate.

The Wards were as usual kept bright and cheerful of aspect with flowers and plants throughout the year; presents from the friends and relatives of the patients, many of them quite poor people. The "Toy Fund" too, has been kept in tolerably sound condition, chiefly by the donations of patients and their friends. The grounds about the Hospital continue to improve in appearance, and the garden is sufficiently fertile to keep the whole establishment very fairly supplied with vegetables, during the major part of the year 4,008 articles were passed through the steam disinfector.

NOTIFIED INFECTIOUS DISEASES.

Scarlet Fever.—796 notifications of Scarlet Fever were sent to me during the year; the heaviest incidence of this disease we have experienced since I have been in the City. Of these 796 notifications, 535 were primary, and 246 secondary infections, the remaining 15 occurring in public institutions. During the whole of the year the disease was practically epidemic, and we had to deal with a prolonged and persistent prevalence, rather than with sharp outbreaks. The cases declined somewhat during the holidays, but otherwise continued with steady persistance throughout the year. Although the re-opening of the schools was followed by an increase in the amount of the disease, it was so widely distributed and so little concentrated in any one particular district that I did not deem necessary to advise the closing of but few schools in consequence of it. Chart I. gives a graphic representation of the prevalence, week by week, of the disease, and *should be attentively studied.* I do not regard the occurrence of Scarlet Fever in or under the proportion of one case to every ten thousand of the population a

week, or, roughly, 10 cases a week, as constituting an "epidemic" of the disease; to deal with this amount our present Fever Hospital *accommodation is inadequate.*

Of the cases notified to me 55·0 per cent. occurred in females and 45·0 per cent in males, a result curiously like to that of the preceding year; 31·0 per cent. of the patients were between 1 and 5 years of age; 43·0 per cent. between 5 and 10 years of age; 18·0 per cent. between 10 and 15 years of age; 5·0 per cent. between 15 and 25 years of age; and 3·0 per cent. over 25 years of age. It will be noticed that 92 0 per cent. of the cases occurred in patients between under 15 years of age—the school-going period.

From enquiries specially conducted I found that of the infected dwellings 5·0 per cent. possessed only *one sleeping room,* the average number of the occupants being 4 persons; 31·0 per cent. possessed *two sleeping rooms,* the average number of the occupants being 3 persons per room; 50 0 per cent. possessed *three bedrooms,* the average number of the occupants being 2 persons per room; and 13·0 per cent. possessed *four or more bedrooms,* the average number of occupants being 1·75 persons per room.

As regards the disposal of excrement 50·0 per cent. of the infected dwellings used "bins," 32 per cent. "pail" closets, and 19 per cent. water-closets.

I was not able to trace Scarlet Fever to any special milk supply, and am disposed to think that a great majority of the cases owed their infection to personal contact; as to the origin of this disease we are in greater doubt than is the case with other zymotic ailments, and so long as this uncertainty continues our operations for preventing those conditions from arising which favour its development will be *pari-passu* imperfect, and our practical work confined rather to dealing with effects than causes. Scarlet Fever, unfortunately, seems likely to prove as great a source of vexatious trouble to Sanitary Authorities in the future, as it has pertinaciously done in the past. I am inclined to think that common use of an infected closet is a method by which this disease is propagated, *i.e.,* that the excrement of an affected person is infectious.

Diphtheria.—There was a decline in the amount of Diphtheria notified as compared with 1897, the actual number being 53. The number of notifications was 61 in 1897, 94 in 1896, in 1895 it was 77, in 1894 it was 120, and in 1893 it was 134; so that we have had a better record than in any year since I have been in the city. There were 14 deaths recorded from this disease during the year, 1 of them in the Norfolk and Norwich Hospital. Seven of the fatal cases occurred in persons under 5 years of age, and 7 in persons older. The special death rate was considerably higher than in 1897, being 1 in 4 in place of 1 in 6·75 persons attacked.

The 53 cases of Diphtheria notified to me occurred in 43 dwellings —there being 10 instances of secondary infection, or 1 to every 4·3 primary cases. Of the persons attacked 56·6 per cent. were females and 43·4 per cent. males—a preponderence of former sex sufficiently marked to suggest that the home-keeping habits of the female victims had an influence in determining the incidence of the disease.

22·6 per cent. of the patients were under 5 years of age, 37·7 per cent. between 5 and 10 years, 22·6 per cent. between 10 and 15 years, 7·5 per cent. between 15 and 25 years, 9·4 per cent. over 25 years of age. It will be noticed that half of the fatal cases occurred in children under 5.

Systematic enquires into the home surroundings of the patients entitles me to state that 14·3 per cent of the infected dwellings possessed *only one sleeping room*, the number of the occupants averaging 4; 30·9 per cent. of the houses possessed *two sleeping rooms* the average number of the occupants (of each room) being 3; 38·09 per cent. of the houses had three bedrooms, the average number of occupants being 1·75; and 16·6 per cent. of the dwellings possessed 4 or more bedrooms with an average population of 1·5 persons per bedroom. 35·0 per cent. of the affected households made use of "*bins*," 35·0 per cent. used *pail-closets*, and 30·0 per cent. *water closets*. In 20·0 per cent. of the houses there was evidence of persistant *dampness*, commonly of the walls or flooring, and due to the *absence of a "damp course"* in the former, and of a layer of *concrete* below the latter. On account of the importance of causes of persistent dampness in or about a dwelling I caused special enquiries to be made concerning the character of the paving, etc., of the yards adjacent to the infected dwellings, and found that 27·0 per cent. had yards covered with some *material impervious to fluids*; that 25·0 per cent. had yards partly paved, 20·0 per cent.

cobbled yards, and 26·0 per cent yards *without any paving at all.* In other words 73 per cent. of the houses *adjoined yards offering greater or lesser facilities for the soakage of fluid into the soil about them.* 35·0 per cent. of the houses possessed no sinks, which means that *all household "slops,"* etc., and *other waste fluids would be pitched into and about the gutter in the yard,* 2·5 per cent. of the houses had sink pipes in *direct communication with the sewers,* and there was found to be some more or less grave defect in the drainage at 12·0 per cent. of the infected dwellings, and one house had no drainage arrangements of any kind.

Chart I. exhibits the variation in the prevalence of Diphtheria week by week throughout the year, and how far it was influenced by the continuance of fine or wet weather. I retain my belief that any condition of the atmosphere or of the surroundings, which tends to produce a congested condition of the tissues lining the throat—such as damp foggy weather, particularly when associated with low barometic pressure which leads to engorgement and relative congestion of the superficial vessels; or any irritating influence such as the noxious effluvia constantly given off by the contents of "bins," "pail-closets," collections of refuse, etc.—distinctly favours the development of Diphtheria. The disease was with, as I think, real justification attributed in 5 sporadic instances last year to the pollution of the surrounding atmosphere, caused by the emptying of "bins." What is certain is the fact that no other specially predisposing influence could be in any way traced, and in each and all of these five cases the disease followed the removal of the contents of the "bins," and was by the inmates of the houses also attributed to the nauseating stench which pervaded the dwellings during the scavenging operations. It is, of course, possible that the contents of the "bins" in question were specifically infected.

Enteric (Typhoid) Fever.—259 cases of Enteric Fever were notified to me during the year, 24 of them being secondary infections. As the relative prevalence of this disease is a commonly accepted criterion of the sanitary condition of a district, its associations and surroundings become a special interest, and the importance of the subject justifies a more detailed account than is requisite in dealing with other filth diseases; the more particularly as Enteric Fever is rather *endemic* than epidemic in its character with us—that is to say it has been prevalent for so many years that it must be looked upon as having rooted itself among us.

The following table gives the notifications of Enteric Fever in each year from 1880 to 1898 inclusive, and the mortality from the disease.

180	notifications of Enteric F. in	1880	with	37	deaths representing a mortality rate of		20·5%
50	,,	1881	,,	15	,,	,,	30·0 ,,
47	,,	1882	,,	8	,,	,,	17·4 ,,
34	,,	1883	,,	11	,,	,,	32·3 ,,
121	,,	1884	,,	30	,,	,,	24·8 ,,
584	,,	1885	,,	92	,,	,,	15·6 ,,
262	,,	1886	,,	39	,,	,,	14·5 ,,
136	,,	1887	,,	20	,,	,,	14·7 ,,
171	,,	1888	,,	19	,,	,,	11·1 ,,
166	,,	1889	,,	22	,,	,,	13·2 ,,
176	,,	1890	,,	31	,,	,,	17·6 ,,
163	,,	1891	,,	21	,,	,,	12·8 ,,
106	,,	1892	,,	19	,,	,,	17·9 ,,
314	,,	1893	,,	36	,,	,,	11·4 ,,
150	,,	1894	,,	22	,,	,,	14·6 ,,
226	,,	1895	,,	24	,,	,,	10·6 ,,
196	,,	1896	,,	20	,,	,,	10·2 ,,
234	,,	1897	,,	33	,,	,,	14·0 ,,
259	,,	1898	,,	48	,,	,,	18·5 ,,

It will be noticed that the death-rate in 1880 from this disease averaged 20·5 per cent. of the cases notified, or roughly, 1 case in every 5, and that last year the death rate was 1 case in every $5\frac{1}{2}$. As I mentioned in my previous report, it does not necessarily follow that these figures represent the true state of the facts; that there has been on the whole a diminution in the case mortality cannot be doubted—but it must be remembered that most probably a number of the milder cases of the disease were not recognised and notified in 1880. Increasing skill in diagnosing the disease in its lighter forms has, in my judgment, led to a more accurate correspondence between the number of notifications sent in and the actual amount of the disease; although I still think that a number of cases of Enteric Fever, of what is known as the "ambulatory" type, escape notification, and never receive medical treatment. So that here, as elsewhere, the notifications furnish a reliable guide to the relative prevalence of the disease, but must not be regarded as accurately representing the full amount. By "Ambulatory" Typhoid is meant so mild an attack that the patient keeps walking about, pursuing his or her ordinary vocation in life, never ill enough to need a doctor, having some feeling of malaise and what is

thought to be some transient diarrhœa. A lessening of the mortality from this disease could be confidently looked for if we were able, as I hope ere long we may be, to set aside a pavilion at the Isolation Hospital for the treatment of the disease when it occur in cramped, crowded dwellings. It is in such cases as these that the disease becomes most fatal, not necessarily on account of the severity of the seizure, but almost necessarily on account of the unfavourable nature of the surroundings. In two houses in this city, in 1896-7, adjoinging each other, out of sixteen inmates, fifteen, one after another, fell victims to the disease; and three out of these fifteen persons died from it. It is my belief that if I could have removed the first case the other cases would not have occurred.

Turning now to a consideration of some characteristics of the 259 cases notified in 1898, and comparing them with 1897, 1896, and 1895, we find:

(*a*) sex. That 51·4 per cent. of the cases occurred in males and 48·6 per cent. in females; the average per centages of the preceding three years were, males 48·5, females 51·5. Why these changes have occurred I do not know; the females are commonly more home-keeping in their habits than the males; on the other hand the latter expose themselves to more extended means of infection.

(*b*) age.

		Average percentage of the preceding 3 years.
10·9	per cent. of the patients were under 5 years of age	10·0
15·6	„ „ between 5 and 10	18·8
17·7	„ „ „ 10 and 15	20·3
15·2	„ „ „ 15 and 20	17·2
10·8	„ „ „ 20 and 25	10·4
15·2	„ „ „ 25 and 35	13·4
8·4	„ „ „ 35 and 45	6·4
6·2	„ „ „ over 45	4·0

It will be noticed that no less than 44·0 per cent. of the cases occurred in children under 15 years of age—what may be called juvenile typhoid, being a marked characteristic of the Enteric Fever which prevails in Norwich. The average number of such cases in the preceding three years was 48·0 per cent. of the total number. More cases

in persons over 45 years of age were notified, the increase under this heading being 30·0 per cent. above the average of the preceding three years.

(*c*) crowding.

		Average number of occupants.
5·8	per cent. of the affected dwellings had only 1 bedroom	4·0 persons
40·2	" " " 2 "	2·5 "
39·1	" " " 3 "	1·75 "
14·9	" " " 4 or more "	1·5 "

The average corresponding percentages of the preceding three years were 1 bedroom, 5·7 per cent.; 2 bedrooms, 35·9 per cent.; 3 bedrooms, 46·7 per cent.; 4 or more bedrooms, 11·8 per cent.; the relative overcrowding being 3·25, 3, 2·25, and 1 person *per room*. So that the disease this year invaded a few more of the worst and of the best houses than in the preceding three years. In estimating the influence of "man-crowding" I have only concerned myself about the number of sleeping rooms, the rooms in which crowding becomes important. The census returns are only helpful here in respect of tenements consisting of one room, which room must, of necessity, be used for bed and living room. At the 1891 census there were 2·1 per cent. of the Norwich dwellings which consisted of one room only, and when it is remembered how large a proportion of these are occupied by one old man or woman living alone, the incidence of the disease in one bed-roomed houses is probably much heavier than the figures represent.

(*d*) water supply.

88·3 per cent of the affected dwellings were supplied with the Company's water.

11·7 per cent. of the affected dwellings were supplied from wells.

Of the preceding three years the (averaged) corresponding proportions were 84·6 and 15·3 per cent.

The proportions in which houses are supplied with "pipe," or with well water are quietly but *continuously* altering; each year sees an increase in the number of houses supplied by the Company, and a decrease in the number of those drawing water from wells. I believe that at the present time about 90·0 per cent. of the houses are supplied by the Company with water; bearing that fact in mind it will be at once seen that if we are to attribute the propaga-

tion of Typhoid to water supplies, we have to practically impeach the Company as well as the wells. 48 wells were closed during the year, the water drawn from them being shown by chemical analysis alone to be unfit for drinking purposes. We have, thanks to a resolution passed by the Sanitary Committee, been enabled to submit the Company's water to the much more rigid test of bacteriological investigation, in addition to chemical analysis with satisfactory results. The persistence of Typhoid among us makes it necessary for us to take every possible precaution with regard to water. I do not myself believe that any serious portion of our Typhoid was occasioned in 1898 by the consumption of contaminated water; else we ought to have had a heavier incidence of the disease among the drinkers of well waters, and also among the well-to-do drinkers of the Company's waters. That the said Company expends great care upon the filtration and storage of the water it supplies to citizens, I feel it my plain duty to bear witness, and short of the demonstration by bacteriological experts of the specific bacillus of Enteric Fever being distributed with the fluid, I see no sufficient reason for dissenting from the opinion expressed by the Official Analysts that it is "a perfectly safe water for dietetic use."

(*e*) Milk Supply :—

1898.	Corresponding (averaged) proportions in the preceding three years.
2·5 per cent. of the patients drank no milk	6·0
18·0 per cent. of the patients drank it in the raw uncooked condition ...	29·0
79·0 per cent of the patients drank it only when first boiled or cooked in puddings or in hot tea, &c. ...	70 0
0·5 per cent. of the patients used condensed milk	0 75

Milk, I think, had little, even less than in preceding years, to do with propagating Enteric Fever among us: its influence anyway must have been limited, for practically it could only be a source of infection in 18 0 per cent. of the cases, among the drinkers of the uncooked article. At the same time I am bound to say that but for the fairly general cooking of the milk consumed among us we are practically at the mercy of the surrounding districts; so large a portion of our supply comes from outside the city; and unfortunately the want of a Medical Officer of Health for the County of

Norfolk is felt in more than the arrangement of concerted action in the matter of milk supply between the City and the County Sanitary Authorities.

(*f*) Shell-fish. So far as I could learn 85·0 per cent. of the cases *ate no Shell-fish, either in the cooked or uncooked conditions, within three weeks of the outset of their ailment.* In the preceding three years the corresponding (averaged) percentage was 82·0, so that this possible source of infection could not affect more than 15 per cent. of the cases last year, even supposing that the whole of these ate their shell-fish in an uncooked condition.

(*g*) Disposal of excrement :—

62·0 per cent. of the affected dwellings used "bins"
27·0 „ „ „ „ pail closets
11·0 „ „ „ „ water closets

(Of the water closets the Inspectors reported 3·0 per cent. as "defective.") In the preceding three years the corresponding (averaged) percentages were 60 per cent. "bins"; 33·0 pail closets; 10·5 water closets. It is much to be regretted that the power of the Sanitary Authority to enforce the provision of water closets is so seriously restricted, as under the existing laws it is, unfortunately, unless the Health Committee decide in each particular instance, that there is insufficient accommodation, it cannot enforce a water closet (*which it always recommends*), except in the now rare circumstance of the excrement having to be removed *through* a dwelling, in the which case water closets are always insisted upon. Then many of the new houses *comply with the Building Bye-Laws*, under which the Executive Committee now sanctions the erection of new dwellings *by providing a pail closet.* So that year by year the total number of these latter closets increases. Last year 20·0 per cent. of the new dwellings occupied were provided with pail closets.

The number of houses supplied with water closets* amounts to a little more than one-fourth of the whole or 25·0 per cent.; rather more than another fourth have pail closets, and the remainder

* On the 31st of December, 1897, the Waterworks Company were supplying water to 6150 water closets—in many instances more than one being attached to a single dwelling.

"bins." Regarding the pail closets as small, movable "bins" (which indeed they are), it will be seen that 89·0 *per cent. of the cases occurred in dwellings which retained the excrement of the occupants about them.* I regard this demoralising practice, in so many of the Norwich people, of preserving excrement in the neighbourhood of the dwelling as constituting a very efficient agency for predisposing themselves to Typhoid; and am pretty sure that the systematic adoption of efficient water closets throughout the City would very materially lower the amount of Typhoid among us; lower it in fact (together with really good drainage) as nothing else is likely to.

(*h*) Household drainage: –

At 43·0 per cent. only of the affected houses the inspectors reported the drainage as "good." In the preceding three years the corresponding (averaged) percentage was 41·0 per cent.

Which means that, in the others, some defect in the drainage such as no sink (which means that all slop and other waste water would be pitched about the yard), sink waste pipe not disconnected, or loose and defective "traps," &c, existed.

(*i*) Character of yard :—

	Average of the preceding three years.
0·4 per cent of the affected dwellings had no yard	1·25
24·6 per cent. of the dwellings had paved yards	27·4
31·0 per cent. of the dwellings had *unpaved* yards	32·5
16 8 per cent. of the dwellings had *partly paved* yards	8·0
27·4 per cent of the dwellings had *cobbled* yards	27·4

In other words, 75·0 per cent. of the dwellings had yards more or less liable to have *the subsoil soddened with moisture and impurities.* I have repeatedly drawn attention to the importance of having the soil which adjoins a dwelling covered with some material impervious to fluids, else it cannot be kept dry. A large number of the poorer dwellings in this City have no properly constructed "damp course" in the walls, and in addition have not had a thick

layer of concrete laid under the bottom floors; in such cases moistening of the subsoil must lead to dampness in the dwelling, to say nothing of the deleterious ground air which will be forced upwards by the rising of the ground-water from time to time; and always be more or less sucked into the dwelling, owing to its atmosphere being warmer.

(*j*) Food Store. In 4·0 per cent. of the affected dwellings food was stored in a receptacle situated inside the living room, but having direct communication with the external air; in 9·5 per cent. food was stored in a similarly ventilated receptacle elsewhere; 14·5 per cent. of the dwellings had the household food stored in an unventilated receptacle (*i.e.*, having no communication with the external air) in some part of the house, other than the living room; and in no less than 72·0 per cent. of the dwellings, the food was stored in some unventilated receptacle *in the actual living-room*. In the preceding three years the food store was some unventilated receptacle *in the actual living-room* in (averaged) 84·0 per cent. of the affected dwellings.

It is worthy of notice that in 72·0 per cent. of the affected dwellings, the food was stored in the living room, and therefore in an atmosphere more or less stale and impure. Without assuming a direct connection between such food and a disease like Typhoid, it will be obvious that articles of food such as milk, butter, bread, etc., kept in such surroundings might easily become contaminated with impurities.

(*k*) Nearness to sewer gratings and gullies :—

	Average of three preceding years.
9·0 per cent. of the affected dwellings were within 20 ft.	13·5
22·0 per cent. of the affected dwellings were within 40 ft.	29·0

The remainder were over 40 feet. These measurements were taken because a stench from a grating or gulley has been so constantly charged by people near with occasioning Typhoid; my own belief is, *that pollution of the neighbouring air with sewer gas, lowers the resisting powers of the body*, and thus causes those exposed to so deleterious an influence to fall more easily a victim of disease. I am of opinion that the emanations from collections

of excrement in "bins" and pail-closets, and from heaps of decaying refuse, act in the like manner as powerful predisposers of disease.

(*l*) Occupations of householders.

222 dwellings were affected: 44 labourers, 30 shoemakers, 8 (each) hawkers, and persons following no definite employment, 6 (each) publicans, bricklayers, tailors, 4 (each) tailoresses, carters, starch packers, and agents, 3 (each) nurses, painters, porters, warehousemen, stonemasons, coach-builders, gardeners, compositors, dressmakers, and cab-drivers, 2 (each) sawyers, brewery-men, canvassers, blacksmiths, draper's assistants, starchmakers, plumbers, printers, domestic servants, and school teachers, 1 (each) a platelayer, a plasterer, a roadman, a dustman, a tailor's cutter, a coach painter, a school mistress, a charwoman, an omnibus driver, a hotel "boots," a chairmaker, a rag and bone dealer, a grocer's assistant, a paper maker, a pork butcher, a miller, a baker, a basket maker, a hair dresser, a currier, a general dealer, a journalist, a wherryman, an iron moulder, a clerk, an engine-fitter, a cathedral sub-sacristan, a private secretary, a milliner, a prison warder, a wine merchant's cellarman, a shopkeeper, a boxmaker, a weaver, an organ grinder, a railway fireman, a greengrocer, a spinner, a school attendance officer, a builder, a mustard maker, a wheelwright, a tailor's packer, an accountant, a corporation engine-driver, a yachtsman, a brush-maker, and a pig slaughterer.

(*m*) Secondary cases.

In 21 dwellings more than one member of the household contracted the disease.

Taking all the facts brought to my notice in these detailed investigations during the past four years into consideration the following summary represents the conclusions I have at present arrived at.

(1) That Enteric Fever (as shewn by the number of notifications) has been prevalent in Norwich for the last 18 years.

(2) That while there has been on the whole, a seasonal increase of the disease in the autumn months, the disease has persisted throughout the year.

(3) That what may be described as the *endemicity of the disease in the City, appears to be associated with the methods of disposing of excrement followed*, and with defects in the sewerage and drainage.

(4) That while specifically polluted water and milk may be occasional causes, there is no sufficient evidence that they constitute the main persisting causes.

(5) That bedroom crowding exerts a predisposing influence, probably by lowering the standard of healthiness in those subjected to such undesirable household conditions.

(6) That emanations from sewer gratings, untrapped gullies, and more particularly collections of festering excrement exert a *predisposing influence in those exposed to them.*

(7) That the existence of some thousands of fixed and movable "bins" is unquestionably a source of continuous pollution alike to the *soil* and the *air* in the neighbourhood of the dwellings, and affords *favourable conditions for fostering a filth-disease like Enteric Fever;* and that, in scavenging, portions of excrement are liable to fall on to and get trodden into imperfectly paved yards, alleyways, and streets.

(8) That the high proportion of the chlorides and nitrates to be found in the soil of the City bears testimony to *organic pollution in the past*, and *furnishes a favouring nidus for promoting the existence of the specific micro-organism of Enteric Fever.*

(9) That this disease can be most effectually combatted by the adoption of a system of water-carriage for the disposal of excrement, paving all the yards with material impervious to fluids; and providing hospital accommodation for the treatment of such cases as occur in crowded dwellings.

Puerperal Fever.—Fifteen notifications of this dangerous child-bed fever were sent in during the year; there were eight deaths from it. Supposing the notifications to represent all the cases which occurred, the death-rate 54·0 was not an abnormally high one; last year it was 50·0 per cent.; in 1896 it was 75·0 per cent. In 1895 out of thirteen notifications there were but four fatal cases representing a death rate of 30·0 per cent., in 1895 there were the

same number of notifications, but double the number of fatal cases, the death-rate being 60·0 per cent. Puerperal Fever being a preventible disease, we were entitled to look for a diminution in the mortality from it. I forbid the nurse or midwife in attendance to go to another confinement for a period of at least one month, and then only after a thorough cleansing and disinfection of her clothing and person, and as far as possible, dwelling. The medical practitioners in the City I have found anxious to adopt all reasonable precautions, the chief being a temporary abstention from obstetric practice. Rigorous antiseptic precautions in obstetric practice furnish the best means of preventing the development of the disease, and as our midwives become both more intelligent and more scientifically trained, we may justifiably look for a steady lessening of puerperal fever; more particularly when parturient women themselves come to understand the vital importance of scrupulous cleanliness being observed by themselves, their attendants, and in all the surroundings.

Erysipelas is not notified to me, and therefore I only know, as a rule, of its existence from the death returns. Four deaths were registered from it, being double the number of deaths which occurred from the same cause in 1897, and two-thirds of the number which was recorded in 1896. Erysipelas of a fatal type cannot be regarded as having been prevalent in the city. Some of the medical practitioners favour me with gratuitous notifications of the occurrence of Erysipelas among their patients, and in consequence of this information I have had the dwellings inspected, and in the majority of the cases been able to have some more or less serious defect in the sanitation of the dwellings remedied. I hope more of the doctors will *gratuitously notify the infectious type* of Erysipelas.

Measles, I regret to say, is not notified to me, and I only learn of its prevalence through the deaths from it, and the weekly returns of the causes of absence of children from the schools. The latter valuable information I only receive from the Elementary Schools under the immediate control of the School Board. I grieve to say that the Voluntary Schools do not furnish me with it. Measles being a dangerous disease, particularly on account of its possible complications, and on account of its infectivity a source of administrative trouble to all concerned with the management of schools, I am still of opinion that the Urban Sanitary Authority would act wisely if it adopted my recommendations and agreed to pay for the notification of *first cases in separate dwellings*—for it is only in this way that we can secure early information of the

development of fresh centres of infection, and warn the school authorities to exclude *all* the children coming from an infected dwelling. I believe, too, that such notification to the Sanitary Authority, with the visitation of the affected dwelling which follows, would in time, lead to a much-needed alteration in the attitude assumed by the mothers, in Norwich, towards this really dangerous, infectious disease, and the criminality of carelessness regarding it. Last year I had, unfortunately, to advise the closing of 14 schools on account of the spreading of the disease among the children ; and not less than 76 deaths were recorded from it.

Whooping Cough proved fatal to 36 children last year. It swept off 43 in 1897. This is a result for 1898 which is not very satisfactory even considering how highly infectious this disease is, and dangerous too. I gain information of its prevalence among children attending the Board Schools from the weekly returns, but as is the case with reference to Measles not from the other elementary schools. In 1896 there was unusually little of it.

Diarrhœal diseases carried off 203 persons, 191 of whom were *under 5 years of age,* the greater number succumbing (as is customary) in the third quarter of the year. In 1897 there were 159 deaths from these diseases. I attribute the heightened prevalence of and mortality from this disease to bad feeding, to the favouring temperature and weather which prevailed ; and practically the other conditions which favour the development of these diseases—*soil and air pollution,* were aggravated by the sewerage operations.

Influenza.—32 deaths were certified to be either directly or indirectly due to this disease; in 1897 the number of deaths similarly ascribed to it was 15 ; in 1895 the number of deaths was 22. The disease was never once epidemic throughout the year.

The following school was closed at my suggestion on account of Scarlet Fever—Horn's Lane Girls' School, and on account of Mumps —Nelson Street Infants' School. The Quay Side (Infants'), Crook's Place (Infants'), Avenue Road (Infants'), Thorpe Hamlet (Infants'), Angel Road (Infants'), Surrey Road (Infants'), Horn's Lane (Infants'), Horn's Lane (Junior), New Catton, Philadelphia Lane (Infants') and "Mixed" Board Schools were all closed on account of Measles—as were also the St. Peter-per-Mountergate, St. Mark's, Lakenham, and St. Stephen's Voluntary Schools.

THE TUBERCULOUS DISEASES.

(Forms of the disease commonly called "Consumption.") 119 deaths were certified to be due to tuberculous disease of the Lungs (Phthisis) and 97 to other forms of tuberculous infection; making in all a total of 216 deaths from the tuberculous diseases. This is a lower sum-total than occurred in 1897, and is well below the average for the preceding five years; which average amounts to 242 deaths from the tuberculous diseases per annum. I am hopeful that at length the people of Norwich are beginning to realise the fact that the tuberculous are *distinctly infectious* diseases, and to treat them accordingly. Nothing but benefit to the healthiness of our community can result from the general apprehension of the fact that the tuberculous diseases are dangerous—particularly the phthisical type. If the improvement signified by last year's total of 216 deaths can be increased, we shall feel that we have done well in insisting upon the dangers to the community of these *catchable and largely preventible diseases.* Chart II. shows the weekly fluctuations in the tuberculous death-rate throughout the year; and it will be worth the reader's while to compare the chart for 1898, with the charts for the five preceding years. The returns for these six years confirm our belief, admitting of practically no qualification, that the *tubercle bacillus* (the micro-organism of whose pernicious activity these diseases furnish us with reliable information) is no stranger among us. It flourishes practically wherever people are crowded together, and may be said to be permanently entrenched in all old cities. This lethal bacillus which has cost, and is still costing us, as a nation, directly or indirectly, millions of money, and goes on reaping its untimely harvests of valuable lives year after year, is most at home in dark, ill-ventilated places, and is much favoured by overcrowding in any dwellings. *Sunlight and fresh air are fortunately destructive to it;* which fact helps to explain why sanitary experts claim that every dwelling shall have good air space, and freedom for the admission of sunlight into and about it.

In 1893 I first offered to gratuitously disinfect the rooms, which had been occupied by a tuberculous patient, after the removal by death, or otherwise, of the victim of the *tubercle bacillus.* During the following year, 1894, five rooms were so disinfected; in 1895

the number rose to 39, in 1896 to 56, in 1897 to 81, and last year at exactly half the number of fatal cases, all of which disinfections were carried out after the death of a person from the phthisical form of the disease. I regard these figures as indicating a really remarkable growth of opinion on the part of the public, that it is a wise step to have rooms, etc., disinfected after a death has occurred from tuberculous disease; and can only hope that the practice will become general. I also hope that the members of the medical profession will recommend disinfection to the friends of their patients in all cases of death, or of removal. It is at any rate encouraging to find that within 3 years, the relatives of more than one half of the fatal lung cases wished to have this precautionary measure adopted for the protection of the other inmates of the dwelling.

I make no apology for again directing attention to the fact that the *tubercle bacillus* is constantly *coughed up* in large numbers *w th the expectoration* of consumptive people, and that the same bacillus is commonly present in the discharges from tuberculous glands, abscesses, etc. Should hœmorrhage occur, the specific bacilli will be pretty certainly carried out with the blood. Hence the importance of either rigidly disinfecting (boiling is a good method), or burning any rags, clothes etc., soiled with the blood or expectoration. For if the extruded matter be left to dry, it will, in time, become fine dry dust; which dust may be kicked or brushed up into the air, and as it contains the potentially active bacilli, it may be the means of introducing these into the lungs of others; or the expectorator of the infective material, may, in this way, re-infect himself. The risk of infection is specially great when the epithelium (an exquisitely delicate protective membrane) lining the respiratory passages becomes from any cause abraded (as for example, after an attack of Bronchitis, Whooping Cough, Measles, Influenza, etc.) It is not only a piece of enlightened self-interest on the part of a consumptive, to take care that all expectorated matter is rigidly disinfected, or what is better, promptly burnt! but it is also his imperative duty to minimise the risk to his fellows by so doing. It is *what a consumptive coughs up* that is to be feared; not his mere breath—one may sit for example, in the same room with him, if it be well-ventilated, and his habits are cleanly, without practical risk. Spitting about in public places and vehicles, becomes, when the spitter is a consumptive, in addition to being a disgusting habit, a dangerous one as well; a habit that should be rigorously discouraged, alike in the interest of decent manners, and of the

general health. A consumptive can always carry a damp rag with him, which rag he can afterwards easily burn.

Unfortunately a very large number of people inherit a predisposition, that is a heightened liability to fall victims to tuberculous disease; and many others favour the development of the disease in themselves, through lowering their general tone by living amid surroundings of a depressing character such as *ill-lighted, dusty, and badly-ventilated* shops, work-rooms, houses, and offices. A person enjoying fairly good health, may, and probably does, take in tubercle bacilli, from time to time with his food and air; but the resisting power of his tissues is commonly able to cope successfully with the invaders; the person, however, whose health is below par, in particular, if the protective pulmonary epithelium be abraded by coughing, etc., and whose tissue-resistance is enfeebled, such an one all too frequently succumbs—and the onset is so insidious that the bacilli may get a firm hold before the mischief is noted. The great general preventives of consumption are *good food, bodily exercise, sunlight,* and above all *fresh air* in generous abundance.

When a member of a household have fallen a victim to one or other of the tuberculous diseases, it is not necessary to treat him as a social leper. If precautions be taken to prevent *anything he coughs up* from ever drying, and if the rooms occupied be effectively ventilated he may share in the ordinary family life. He should, however, sleep in a bed by *himself,* and where practicable, *in a separate room;* this room should be as large as possible, and the consumptive should early acquire the habit of *keeping the window always* OPEN supposing as is commonly the case there is no other means of admitting fresh air. Of course the proper way of securing adequate ventilation is to make arrangements *altogether unconnected with the window;* perhaps the simplest, and certainly one of the best means of doing this, is to insert a grating *at the floor level* in the external wall, delivering if possible *fresh air under the bed;* (by means of simple valve, the incoming air can be directed upwards to the bottom of the bed), the atmosphere of the room will then always keep refreshing and healthsome whether the window be closed or not. If such fresh air grating be *not* provided (the expense of inserting one is trifling) then if the window frame reach low down, say to within eighteen inches of the floor, let it be kept open *at the bottom;* if the lower ledge of the window be as it most stupidly usually is, about 3 or 4 feet from the floor, place an accurately fitting piece of board under the lower sash, so to leave a

vertical aperture between the sashes of not less than three inches in depth. Failing all else, open the window *at the top*. In towns the air may be rendered more acceptable to the irritated lung tissues by causing it to pass through a screen of stretched flannel; which will effectually filter out from the air particles of dust, "blacks," &c. *Under no circumstances is it prudent to turn the room into a practically closed box.* Let the bed clothing be warm and light, *e.g., ventilated* eider down quilts. With good air, cold need never be feared. I do not believe that moisture is detrimental to a consumptive, but I do believe that the lowered barometric pressure which commonly accompanies dampness or wet weather is; and on purely physical grounds too; the lowered barometric pressure leading to the engorgement and relative congestive of the superficial vessels. The important point is to keep a consumptive *constantly irrigated with unbreathed air.* It is when the bacillus-riddled victim of tuberculous disease becomes too weak to attend to himself carefully, that the great risk of infecting his bedding, etc., and room occurs, and hence the sensibleness of having these carefully disinfected, after pale Death have entered with equal foot, whether it be in the hovels of the lowly, or the halls of the great.

As is well-known by this time, tuberculous disease may be conveyed to the human by other animals, notably by cattle. Dairy cows in particular, if kept in over-crowded and badly ventilated sheds, fall ready victims to the tuberculous disease, and may, through their milk, convey it to milk-feeding people, particularly children. This danger may be guarded against by, *in all cases, boiling or otherwise thoroughly cooking milk* before consuming it. There is a lessened but still sensible risk in eating the flesh of tuberculous cattle, for the risk cannot be entirely banished by cooking, the interior portions of joints, etc., rarely reaching a temperature sufficiently high to kill the bacilli.

The prevention of infection by dairy and fed cattle is to be found in the employment of a very effective test of the presence of tuberculous disease in an animal. I refer to the injection of "Tuberculin." If the animal be tuberculous, a marked alteration in the temperature and other symptoms follow the injection; and the obvious corollary of such indications of disease should be the prohibition of the sale of the milk or flesh of such animals for human food. It should be the duty of specially appointed veterinary surgeons *to make periodical inspections of all cattle*— to order their destruction when desirable (fair compensation to be

given in all cases where the owner has taken reasonable care to give no encouragement to the disease) and to supervise the disinfecting of all stalls, sheds, &c., which have been occupied by the affected animals. But one fears that these simple precautions would only be adopted when the electors of this Realm of England have realised "that public health is public wealth," and make the promotion of national healthiness "the supreme law."

REPORT

OF THE

PUBLIC ANALYST.

In presenting my third Annual Report to the Urban Sanitary Authority, I have the honour to state that 73 samples were submitted to me during 1898, under the Sale of Food and Drugs Act. Eight of the samples were certified to be adulterated, viz, 7 of milk and 1 of butter.

SAMPLE.	Total No. Submitted.	No. Adulterated.
Milk	47	7
Butter	8	1
Flour	4	0
Bread	3	0
Confectionery	3	0
Cheese	2	0
Lard	3	0
Jam	1	0
Pepper	2	0
Totals	73	8

I tabulate the percentages of adulteration in Norwich during the last three years in comparison with the figures for the country as a whole, during 1897 :—

Norwich.	1896.	1897.	1898.	The whole country, 1897.
Total per centage of adulteration	26 6	16·1	11·0	9·4
Per centage of adulteration of milk	44·4	27 2	14·9	10·4

These figures show a markedly progressive improvement as a result of the way in which the Acts have been worked in the city during the last three years. The total per centage of adulteration of milk is nearly one-third less than it was in 1897, and the per centage of adulteration of milk is little more than half what it was in 1897, whilst it is actually one-third of the per centage for 1896.

During the year I have examined 115 samples of water drawn from wells in the city, and of these I reported 57 as injurious to health. During the last three years I have been compelled to condemn as many as 120 of these (for the most part) shallow wells, either as being grossly polluted with sewage and surface filth, or as loaded to a dangerous degree with the oxidized products of soil filtered sewage. There is a large number of these wells in the city, from which some thousands of the population draw their sole water supply. As each is a possible centre for the communication and dissemination of specific disease, it is obviously of the greatest importance not only to watch them narrowly, but to condemn them whenever possible.

W. LINCOLNE SUTTON, F.I.C.

Public Analyst for East and West Suffolk, Norwich, Ipswich, and Bury St. Edmunds.

REPORT

OF THE

CHIEF SANITARY INSPECTOR.

SANITARY DEPARTMENT,

MUNICIPAL BUILDINGS, 1899.

TO THE MEDICAL OFFICER OF HEALTH.

DEAR SIR,

The following is a brief summary of the work done during the year ending December 31st, 1898.

4 445 Nuisances detected.
833 Notices served by order of the Health Committee.
1,580 Preliminary notices served.
5,842 Premises reinspected.
2,447 Premises at which nuisances have been abated.
2,167 Special complaints have been received and the premises inspected.
505 Letters sent in order to obtain the abatement of Nuisances
219 Reference to the City Engineer.

The following are the principal matters which have been dealt with :—

771 Orders served to put foul bins into a sanitary condition.
730 ,, ,, efficiently trap yard drains with gullies.
463 ,, ,, cleanse and unstop yard drains.
358 ,, ,, provide efficient privy pans and dust receptacles.
285 ,, ,, repair defective privy pans.
284 ,, ,, repair or disconnect rain water pipes.
228 ,, ,, remove and cease to keep animals.
206 ,, ,, repair defectively paved yards.
205 ,, ,, disconnect sink waste pipes over gullies.
103 ,, ,, repair defective surface drains.
88 ,, ,, remove foul accumulations.
70 ,, ,, cleanse dirty houses.
70 ,, ,, abate overcrowding.
59 ,, ,, repair defective water closets.
52 Cases of insufficient privy accommodation have been dealt with.
51 Orders have been served to repair defective eaves gutters.
51 Cases of insufficient water supply have been dealt with.
51 Orders have been served to repair defective houses.
50 ,, ,, empty and cleanse foul cesspools.
29 ,, ,, repair defective pumps.
15 ,, ,, provide efficient water closets.

NOTE.—*A large number of Nuisances have been abated, Privy Bins abolished and Water Closets substituted; in cases where no Notices have been served.*

INFECTIOUS DISEASES.

1,132 Visits have been paid to infected premises.
557 Rooms have been disinfected upon the removal or recovery of the patient.

Sanitas Fluid and Carbolic Powder Disinfectants have, as in former years been given to householders gratuitously in all cases of infectious disease, and for disinfecting purposes generally.

HOUSE TO HOUSE INSPECTION.

136 Houses and premises have been visited.
88 Nuisances were detected.

YARD AND COURT INSPECTION.

7,668 Visits have been paid to yards and courts.
62 Privies were found dirty.
62 Privies were cleansed.
25 Surface drains were found foul and dirty.
25 Surface drains were cleansed.

All other sanitary defects in the yards and courts which have come under observation during the past year are dealt with in this report under the term "Nuisances" in a preceding column.

SLAUGHTER HOUSES.

1,461 Visits have been paid to slaughter houses.

The walls and floors of certain slaughter houses were on several occasions found to be in a dirty condition, but these were cleansed as directed by the Inspectors.

MARKETS.

The Fishmarket has been visited and inspected daily, and the Vegetable, Fruit, and Provision Markets on market days.

On several occasions it was found necessary to deal with various articles of food which were exposed for sale in a condition unfit for food of man, but such articles have been included in the undermentioned list of Unsound Food.

UNSOUND FOOD.

The following have been destroyed as being unfit for human food :—

5 Boxes of Fresh Herrings
9 Carcases of Mutton
4 Carcases of Beef

1 Carcase of Lamb
1 Box of Norwegian Herrings
12 Bags of Periwinkles
1 Ped of Shrimps
124 Boxes of Kippers
2 Bags of Shrimps

Summary Proceedings were taken in one case where a carcase of Beef was found exposed for sale, and unfit for the food of man, and the defendant was fined the sum of £5 and was ordered by the Court to pay the costs incurred.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

No. of Samples.	Description of Samples.	Result of Analysis.	
		Genuine.	Adulterated
47	Milk	40	7
8	Butter	7	1
4	Flour	4	0
3	Bread	3	0
3	Confectionery	3	0
2	Cheese	2	0
3	Lard	3	0
1	Jam (Greengage)	1	0
2	Pepper	2	0
73		65	8

SUMMARY PROCEEDINGS.

In eight cases proceedings were taken against vendors of adulterated articles :—

7 in cases of Adulterated Milk
1 in case of Adulterated Butter

In 7 of the above cases the magistrates convicted, and imposed fines varying from 5s. without costs, to £1 and 6s. costs In one case the defendant was discharged with a caution.

In two cases the vendors of a very low quality Milk were written to and cautioned.

WATER ANALYSIS.

115 Samples of water have been taken from pumps and draw wells.

51 Samples were certified to be " unfit for drinking purposes " and injurious to health.

64 Samples were certified " Passable."

In 49 cases the owners have supplied their premises with the Water Works Company's Water.

In the other cases the owners have made arrangements whereby a proper supply is provided to the premises

COWSHEDS, DAIRIES, MILKSHOPS, Etc.

181 Cowsheds have been visited and inspected.

249 Milkshops and Dairies have been visited and inspected.

160 Cowsheds, etc., have been limewashed as directed by the Assistant Inspectors.

COMMON LODGING HOUSES.

There are eight registered Common Lodging Houses in the City.

These have been regularly inspected and, with one exception, were found to be conducted in a fairly satisfactory manner.

FACTORIES AND WORKSHOPS.

The undermentioned are the principal matters that have been dealt with at the above class of premises :—

12 Water Closets have been provided
8 Privy Pan Closets have been provided
7 cases of Insufficient Drainage have been dealt with
7 Workshops have been cleansed and limewashed
1 Workshop has been efficiently ventilated
1 Sink drain has been disconnected from the sewer.

And in one case Company's Water has been supplied to the premises.

SCAVENGING.

During the year 18,920 loads of Privy Bin and Privy Pan refuse have been removed by the Night Waggons; and 8,125 loads of House Refuse by the dust waggons in the daytime.

I am, dear Sir,

Obediently yours,

JOSEPH BROOKS, Assoc. San. Inst.
Chief Sanitary Inspector.

Notifications
Scarlet Fever, RED.
Enteric (Typhoid) Fever, BLACK.
Diphtheria, BLACK DASHES.

Chart 1.
Notifications of Infectious Diseases.

Weeks Ending.		8	15	22	29	5	12	19	26	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	Weeks Ending.
		January.				*February.*				*March.*				*April.*					*May.*				*June.*				*July.*					*August.*				*September*				*October.*					*November.*				*December.*					
Weekly Rain-fall in Inches.		0.65	0.04	0.01	0.12	0.97	0.11	0.14	0.11	0.40	0.03	0.09	1.47	0.25	0.16	0.54	—	0.50	0.97	0.80	0.35	0.04	0.97	1.87	0.12	0.31	1.05	0.05	0.10	0.18	1.19	0.61	0.72	—	0.20	0.15	0.01	—	0.10	0.06	0.05	1.09	0.86	0.45	0.42	0.25	0.04	1.71	0.63	0.91	0.05	0.48	0.85	Weekly Rain-fall in Inches.
Mean Weekly Temperature.		43.0	40.7	44.7	42.5	43.1	41.3	42.3	38.0	39.2	37.1	45.2	38.4	39.4	48.7	49.6	44.2	48.4	51.1	49.2	48.1	51.6	51.6	59.0	54.2	60.4	58.6	57.8	58.9	61.5	59.4	62.0	61.0	64.8	63.7	59.9	68.1	64.4	58.7	53.6	55.5	50.8	56.3	54.9	50.2	48.7	49.4	41.9	43.7	48.3	45.8	38.9	41.7	Mean Weekly Temperature.

NO. OF CASES.

NO. OF CASES.

EDWARD BURGESS, Litho., Norwich.

Gross recorded number of Deaths from all causes, BLACK.
" " " " " " " Zymotic Diseases, RED.
" " " " " " " Tuberculous Diseases, BLACK DASHES.
" " " " Births, RED DASHES.

Chart 2.
Weekly Births & Deaths.

Mean Weekly Temperature.	43.0	40.7	44.7	42.5	43.1	41.3	42.3	38.0	39.2	37.1	45.2	38.4	39.4	48.7	49.6	44.2	48.4	51.1	49.2	48.1	51.6	51.6	59.0	54.2	60.4	58.6	57.8	58.9	61.5	59.4	62.0	61.0	64.8	63.7	59.9	68.1	64.4	58.7	53.6	55.5	50.8	56.3	54.9	50.2	48.7	49.4	41.9	43.7	48.3	45.8	38.9	41.7	Mean Weekly Temperature.
Weeks Ending.	8	15	22	29	5	12	19	26	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	Weeks Ending.
	January.				*February.*				*March.*				*April.*					*May.*				*June.*				*July.*					*August.*				*September*				*October.*					*November.*				*December.*						

NO. OF BIRTHS.

NO. OF DEATHS.

NO. OF BIRTHS.

NO. OF DEATHS.

EDWARD BURGESS, Litho., Norwich.